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HOG CHOLERA AND ITS PREVENTION.

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Why does not California raise enough pork to supply her own markets? There are in the great valleys of this State superior advantages for swine raising. The abundant and suitable feed conditions and the superior climatic advantages should make these sections important hog raising centers. The rapid developments in alfalfa planting during the last twenty years, combined with the extensive changes from wheat to barley culture, should naturally be followed by an increase in the number of swine raised. Twenty-five years ago there were more hogs in California than there are to-day. According to the census and the crop reports of the United States Department of Agriculture, there were in this State in 1886 over 1,000,000 head of swine. By 1900 this number fell off to 598,336 head, and even now it is about 800,000.

One of the chief reasons why ranchers in California do not engage more extensively in swine raising is the fear of loss from hog cholera. From reports received at the hog serum laboratory it is thought hog cholera killed 50,000 head of hogs in California last year. They would have been worth, for pork, \$425,000, but taking into consideration their increase in weight and numbers, and the saving in feed and fertility which they would have wrought, their death loss totaled over \$700,000. In one county alone the loss from cholera was at least \$85,000. In another it was \$130,000. According to reports recently received at the Agricultural Experiment Station, the disease now exists in thirty-three counties of the State.

Nature of Hog Cholera.—The disease is caused by germs so small that they will pass through filters that will remove all visible bacteria. The most powerful microscopes known do not magnify sufficiently to enable these germs to be seen, but their presence can be proven in numerous ways. They swarm in the blood and excrement of sick hogs and remain alive in the filth of infected hog pens for months. They are comparatively resistant to disinfectants. Exposure for weeks to 1 per cent carbolic acid solution fails to kill them, although this strength of the disinfectant will kill most bacteria in a few hours.

How Hog Cholera is Spread.—Hogs usually contract the disease through infected food or water. The disease germs do not spread through the air, for susceptible hogs in pens only a few yards from hogs dying of the cholera will remain well, provided their food or water does not become contaminated.

The disease is spread from ranch to ranch in the following ways:

1. Through streams and irrigation ditches which have been polluted with the excretions or bodies of diseased hogs.

2. Through the introduction of infected hogs, by purchase or otherwise. Frequently hogs may have the disease in such a chronic form that they show no suspicious symptoms, but yet they may be capable of infecting susceptible swine.

3. Through the use of infected feed. Garbage from kitchens is often a cause of the disease. It is a well known fact that pork from cholera infected hogs frequently finds its way into the markets, and, although not injurious to man, the uncooked scraps of meat thrown into the kitchen garbage is a not uncommon cause of infection to hogs. There is also reason to believe that tankage from slaughterhouses is sometimes infected. Also, any hog feed that has been shipped in infected cars or wagons, or has come in contact with infected shovels or other implements, is dangerous.

4. The disease may be carried on the boots of men, or by dogs and other animals. Birds are also believed to be responsible for the spread of the disease. The blackbird, pigeon, and similar birds may feed on the grain scattered to an infected band of hogs, and then carry the infection on their feet to another ranch. Buzzards are especially objectionable, because they actually feed on the carcasses of hogs dead from cholera, when these have not been properly disposed of, *i. e.*, burned or buried. Thus, the disease may be carried long distances.

How to Prevent Hog Cholera.—If the hogs on a ranch are healthy they will not develop the disease unless in some way the virus is brought in from an infected place. It cannot develop spontaneously. External vigilance is especially required to prevent its introduction when there are diseased hogs in the vicinity. Hogs should not be permitted access to any stream or irrigation ditch. It is advisable whenever possible to supply them with water from wells or other uncontaminated sources. They should be kept in isolated fields, as far as possible, and protected from the intrusion of men or animals. The filthy conditions under which hogs are frequently forced to live, while not capable of developing the cholera, spontaneously furnish a ready means for spreading the disease when it is introduced. The hog requires clean water just as much as any animal for proper growth and development. Wallows are unnecessary at any time, except, possibly, during the extremely hot weather that prevails at certain times in some sections, and even then they are of doubtful benefit.

What to do When Hog Cholera Occurs in the Vicinity.—When an epidemic of hog cholera occurs, the only safe thing for the hog owners to do is to immunize their hogs to the disease by the use of anti hog-cholera serum and virus. This is obtainable from the University of California. *Until July 1, 1913, the Agricultural Experiment Station, Berkeley, will furnish 500 c. c. of serum free of charge to hog owners in sections where hog cholera exists.* This is enough to immunize 15

hogs weighing from 50 to 100 pounds, or 10 hogs of twice that weight. Application blanks are furnished by the Agricultural Experiment Station, but in case of haste the form at the end of this circular can be filled out and sent by telegraph as a night letter. The Agricultural Experiment Station, at Berkeley, manufactures and sells the serum to hog raisers at actual cost of production, in accordance with an act of the legislature.

There are three methods of producing immunity. One is called the *serum alone* method and consists of injecting anti-hog cholera serum into the muscles of the ham or shoulder by means of a hypodermic syringe. The second is called *the serum and virus method*, or serum simultaneous method. It consists of injecting both the anti-hog-cholera serum and a small quantity of virus (virulent hog-cholera-producing blood). This virus is injected with a separate syringe into the opposite ham or shoulder. The third is called the *double method*, and consists of the injection of the serum alone, followed in ten days with serum and virus.

The following table shows the comparative cost and length of immunity of each of these methods:

	Serum alone.		Serum and virus.	
	Length of immunity.	Cost.	Length of immunity.	Cost.
Suckling pigs 2 to 5 weeks old.....	3 to 6 weeks	\$0.20	3 to 6 months	\$0.32
Weaners 50 pounds in weight.....	3 to 9 weeks	.40	10 to 18 months	.64
Shoats 100 pounds in weight.....	3 weeks to 6 months	.60	1 to 2 years	.80
Hogs 200 pounds in weight.....	3 weeks to 6 months	.80	1 to 2 years	1.25

The cost of the *double method* is twice that of the serum alone, but it has the advantage of absolute safety and permanent immunity.

In case a competent veterinarian is available to administer the serum, it is usually advisable to use the serum and virus method or in case of valuable stock the double method. *In case no veterinarian is available the Agricultural Experiment Station will, if possible, send a man to do the work without charge, other than actual traveling expenses, provided there are at least 150 head of hogs to be immunized.*

To December 31, 1912, the Agricultural Experiment Station has produced 1,735,677 c. c. of serum which has been used on 86,000 head of swine. Twelve per cent of this serum were furnished free, and the rest was furnished at actual cost of production, which was 2½ cents per c. c. until September 1, 1912. Since then it has been 2 cents per c. c. The actual cost of this to the farmers was about \$30,000 and the estimated saving by protecting hogs from cholera amounted to over \$100,000.

The following table shows the results, in part, of the use of the above serum, as shown by signed reports received from hog owners :

Number of hogs on place at time serum was used.	Number of hogs sick on place at time serum was used.	Number of hogs that had died before serum was used.	Total number of hogs treated.	Total well hogs treated.	Total sick hogs treated.	Total number well hogs saved.	Per cent of well hogs saved.	Number of sick hogs saved.	Per cent of sick hogs saved.
26,180	1,970	4,083	15,92	14,995	927	13,46	91%	358	31%

The above figures are in most cases from ranches infected with cholera before the serum was used.

In order to be of the greatest value, hog raisers should not wait for the disease to become evident in their herds, but the hogs on all ranches in the neighborhood where the disease exists should be immunized.

In cases where a night telegram is necessary in sending for serum, the following form should be used :

Veterinary Division, University of California, Berkeley, Calif.:

Send hog serum to

(Insert name of express office here.)

for-----hogs, total weight-----
(Number of hogs.) (Total weight in pounds.)

Before using serum, I agree to fill out, sign, and mail to you the application blanks furnished with serum. I am a resident of California.

(Signed) -----
(Signature of owner of hogs.)